

**INDIANA DEPARTMENT OF TRANSPORTATION  
OFFICE OF MATERIALS MANAGEMENT**

**VERIFYING VACUUM SYSTEMS  
ITM No. 905-08T**

**1.0 SCOPE**

- 1.1** This test method covers the procedure for verifying the vacuum system used in AASHTO T 209, ITM 572, and AASHTO T 331 during the test procedure.
- 1.2** The values stated in either acceptable English or SI metric units are to be regarded separately as standard, as appropriate for a specification with which this ITM is used. Within the text, SI metric units are shown in parenthesis. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other, without combining values in any way.
- 1.3** This ITM may involve hazardous materials, operations, and equipment and may not address all of the safety problems associated with the use of the test method. The user of the ITM is responsible for establishing appropriate safety and health practices and to determining the applicability of regulatory limitations prior to use.

**2.0 REFERENCES**

**2.1 AASHTO Standards.**

- T 209 Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- T 331 Bulk Specific Gravity and Density of Compacted asphalt Mixtures Using Automatic Sealing Method

**2.2 ASTM Standards.**

- D 7227 Rapid Drying of Compacted Asphalt Specimens Using Vacuum Drying Apparatus

**2.3 ITM Standards.**

- 572 Drying HMA Mixtures

**3.0 TERMINOLOGY.** Definitions for terms and abbreviations shall be in accordance with the Department's Standard Specifications, Section 101.

**4.0 SIGNIFICANCE AND USE.** This ITM is used by laboratory personnel to verify that the vacuum system used in AASHTO T 209 is sealed and is capable of maintaining the required vacuum range in the vacuum container for the time required to conduct the test. The vacuum chamber used in AASHTO T 331 and ITM 572 is tested to verify the required vacuum for conducting each of these test procedures.

**5.0 APPARATUS.**

**5.1** Vacuum Gauge, capable of being placed inside the vacuum chamber, and having a minimum range of 10 to 0 mm Hg (10 to 0 torr) that is readable to a minimum of 1 mm Hg (1 torr). The gauge shall be National Institute of Standards and Technology (NIST) traceable and calibrated every three years.

**6.0 PROCEDURES.**

**6.1 Vacuum System (AASHTO T 209).**

**6.1.1** Record the identification number and date of calibration (if gauge) of the residual pressure device

**6.1.2** Record the identification of the vacuum source

**6.1.3** Verify that the location of the vacuum source and vacuum gauge, the vapor trap, the vacuum container, and the residual pressure device are as required in AASHTO T 209

**6.1.4** Place sample and water into the vacuum container

**6.1.5** Seal the vacuum system and start the pump

**6.1.6** Adjust the pressure to the testing range

**6.1.7** Record the value indicated on the vacuum source gauge and on the residual pressure device

**6.1.8** Monitor the residual pressure gauge and the vacuum gauge for  $15 \pm 2$  minutes

**6.1.9** Record the value indicated on the residual pressure gauge and vacuum gauge after  $15 \pm 2$  minutes

**6.2 Vacuum Chamber (AASHTO T 331 and ITM 572).**

- 6.2.1** Record the identification number and date of calibration of the vacuum gauge
- 6.2.2** Place the vacuum gauge inside the vacuum chamber
- 6.2.3** Start the drying apparatus and allow the vacuum to remove the air from the vacuum chamber
- 6.2.4** Record the reading on the vacuum gauge at the maximum vacuum level achieved

**7.0 TOLERANCE.**

- 7.1** The reading of the residual pressure device for the vacuum system used for AASHTO T 209 shall be  $27.5 \pm 2.5$  mm Hg for the entire  $15 \pm 2$  minute period.
- 7.2** The reading of the vacuum gauge used for AASHTO T 331 shall be 10 mm Hg (10 torr) or less.
- 7.3** The reading of the vacuum gauge used for ITM 572 shall be 6 mm Hg (6 torr) or less.

**VACUUM SYSTEM VERIFICATION**  
**ITM 905**

**Vacuum System (AASHTO T 209)**

Residual Pressure Device (RPD) identification: \_\_\_\_\_

If a Residual Pressure Gauge is used, NIST calibration date: \_\_\_\_\_

Vacuum source identification: \_\_\_\_\_

Are components of system in proper sequence? (Y or N): \_\_\_\_\_

Initial vacuum source reading: \_\_\_\_\_

Initial RPD reading: \_\_\_\_\_

Vacuum source reading after  $15 \pm 2$  minutes: \_\_\_\_\_

RPD reading after  $15 \pm 2$  minutes: \_\_\_\_\_

Did both source and RPD reading stabilize? (Y or N): \_\_\_\_\_

Did RPD maintain the range of vacuum for  $15 \pm 2$  minutes? (Y or N): \_\_\_\_\_

**Vacuum Chamber (AASHTO T 331 and ITM 572)**

Vacuum gauge identification: \_\_\_\_\_

Vacuum gauge NIST date: \_\_\_\_\_

Vacuum gauge reading: \_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Verified by: \_\_\_\_\_

Date: \_\_\_\_\_